SCIENCE CURRICULUM

Summer 2 : EYFS – YEAR 6

SCIENCE CURRICULUM INTENT

The Aims of the National Curriculum for Science:

The national curriculum for Science aims to ensure that all pupils:

● develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics

● develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them

● are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Summer 2

EYFS	Focus of Study
FS 1 – Nursery **Milestones** **N1** • Talk about what they see, using a wide vocabulary • Notice differences between objects **N2** • Children will explore collections of materials with similar and/or different properties. (sci) • Talk about the differences between materials and changes they notice. (Sci)	**Context for study:** Exploring Different Types of Materials **Knowledge Content:** Exploring different materials, notice and talk about the differences and sorting materials according to different properties. **Key vocab will include,** sort, difference, same, strong, weak, shadow, light **Working Scientifically in EYFS** I know that materials can be different I know that materials can be the same I know that light can shine through materials I know that light can be blocked by materials. **Scientific Enquiry in EYFS** I can see differences in materials I can sort materials which are the same and different. I can check materials to see if you can see through them.

• Explore how you can shine light through some materials, but not others. Investigate shadows. (Sci)	
F2 - Reception **Milestones** • Children can identify that certain UK animals live in certain habitats/ environments (woodland/ farm/sea/ponds) • Children will record what they see in the natural world around them through drawings or diagrams. • Children can recognise and name parts of a plant. (Sci) • Children begin to understand what they can do to help the environment.(Sci)	**Context for study:** How to take care of the environment. **Knowledge Content:** Identifying different parts of the environment. Identifying habitats/environments within the local area. Ways to look after the environment both locally and at the seaside. **Key vocab will include:** habitat, home, environment, care, pollution **Scientific Enquiry in EYFS** I know different environments like the seaside. I know different environments like the countryside. I know how to care for plants. I know how to care for our school. I know how to care for our outside area. **Working Scientifically in EYFS** I can identify key features of the seaside. I can identify key features of the countryside. I can keep my environment clean.
Year 1	Focus of Study: Animals including humans (extended unit)
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils will be taught to: identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals	**Context for study:** This unit is the first of many science units where pupils study animals, including humans, as part of the discipline of biology - the study of living organisms. From Reception, pupils can name common animals and their babies. Pupils also know the animals that live in particular habitats and know some common features of mini beasts. In Year 1, pupils further develop their knowledge of animals as they are introduced to the concept of 'families' and how animals are grouped according to their shared properties including fish, amphibians, reptiles, birds and mammals. Pupils

identify and name a variety of common animals that are carnivores, herbivores and omnivores describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	learn the key features of each animal family and group them into their correct families. New learning includes identifying and naming a variety of common animals that are carnivores, herbivores and omnivores. Pupils identify, name, draw and label the basic parts of the human body. Pupils also learn about the senses. This unit is the precursor to work studied in Year 2 where pupils learn about how animals, and humans, grow and change. Pupils study life cycles of humans and animals such as butterflies, chickens and frogs. **Extended unit from Autumn 1.** **Begin with retrieval practise of elements of animals including humans from Autumn term.** **<u>Knowledge Content:</u>** The study of animals, including **humans** is part of the discipline of **biology** - the study of living **organisms**. Know that insects are Invertebrate (no backbone), have exo-skeleton, segmented body, lay eggs, have antennae on head Know that mammals have hair or fur, give birth to 'live young', mammal mothers nurse their young with milk, have lungs and need air to breathe, mammals that live on land have 4 legs and ears that stick out, warm blooded. Know that birds have feathers and wings, lay eggs, have two legs, ear holes instead of ears, warm blooded, have a beak. Know that amphibians live on land and in water, have webbed feet, breathe with lungs and gills. cold-blooded, moist smooth skin, no fur or hair, lay many eggs. Know that reptiles have scales not fur, have dry skin, usually lay eggs, sometimes live young, ear holes instead of ears, 4 Legs or no legs, cold blooded. Know that fish breathe under water using gills not lungs, live in water, have scales and fins (no fur or hair), cold blooded, lays may eggs. Know that there are lots of animal groups: arachnids, vertebrate, invertebrate, arthropods and many more. Know what an herbivore, omnivore and carnivore are Know that our senses are sight, smell, sound, touch and taste. Know that sight - Your eyes and light let you see things all around you. Know that smell - You smell using your nose. Know that hearing - Your ears let you listen to sounds.

	Know that touch - Your skill gives you the sense of touch. Know that taste - Your sense of taste comes from your tongue. Know that it is normal for people to be able to do some things and not others Know different body parts – ears, head, hair, eyes. Neck, mouth, shoulder, hand, elbow, knee, foot, toes, leg, stomach/tummy, chest, fingers Know what a magnifying glass and a microscope are Know what camouflage is and why animals do it Linked books – tiger who came to tea, Key Vocabulary: **Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all senses.** **Working Scientifically** I can complete a simple table. I can record my findings using drawings, writing or symbols. I can observe closely the structure of different minibeasts. I can closely observe bird characteristics. I can interpret my results and make simple conclusions. **Scientific Enquiry** I can identify how my body moves. I can identify my 5 senses when exploring the outdoor environment. I can identify different mini beasts based on observations.

	I can research facts about different birds. I can look for patterns in my data.
Year 2	Focus of Study: Plants (extended unit)
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils should be taught to: observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	**Context for study:** This unit follows on from learning in Reception about the seasons and changes that happen to the plants during those seasons. They have also recognised some fruits and vegetables and named the basic parts of a plant. In year 1 the pupils learned about the names of common plants and trees and how to identify them by their leaves. They learn about the terms 'evergreen' and 'deciduous'. In year 2 pupils will recap common plants and trees studied in year 1 before moving onto how plants grow (including germination and pollination), what they need to grow healthily and differences between bulbs and seeds. This unit includes an investigation about growing healthy plants. This is the precursor to work studied in Year 3 looking more at what plants need to grow healthily. They will also study water transportation and the process of the life cycle of the plant including pollination, seed formation and seed dispersal. In Year 6, pupils continue to study plants by studying plant classification for flowering and not flowering plants. **Extended unit from Summer 1.** **Begin with retrieval practise of elements plants from Summer 1.** **See Summer 1 INTENT document to support planning**

Year 3	Focus of Study: Plants continued…
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils should be taught to: identify and describe the functions of different parts of flowering plants: roots,	**Context for study:** This unit is the third of six science units where pupils learn about plants as part of the discipline of biology - the study of living organisms**.** Pupils are able to identify and name a variety of common wild and garden plants including deciduous and evergreen trees. Pupils are also able to identify and describe the basic structure of a variety of common flowering plants, including trees. During this unit, pupils revise a significant amount of knowledge from Year 2: the parts of a plant/tree; the function of each part of a plant; what seeds and plants need to grow and be healthy. This unit also reviews and

stem/trunk, leaves and flowers explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant investigate the way in which water is transported within plants explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	builds upon pupils' knowledge of germination, pollination and life cycle diagrams. New learning includes seed formation and the four methods of seed dispersal. Pupils investigate the way in which water is transported within plants. The knowledge acquired in this unit will help pupils to group and classify living things in Year 4. This is the precursor to work studied in Year 5 when pupils construct food chains and in Year 6 when pupils study Linnaean classification, adaptations and sexual reproduction in plants. **Begin with a re-visit of elements of plants from Year 2.** **<u>See Summer 1 INTENT document to support planning</u>**
Year 4	Focus of Study: Sound continued…
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils should be taught to: identify how sounds are made, associating some of them with something vibrating	**Context for Study:** This is a stand-alone unit where pupils learn about sound as part of the discipline of **physics** - the study of the processes that shape our world and how we use it. It is important to assume that all pupils have very little prior knowledge in this unit. During teaching, extra attention must be given to explicitly teaching the precise meaning of subject specific vocabulary as pupils may be unfamiliar with this. This unit does not link directly with any future science teaching so it is important that knowledge is secured during the unit. In Year 4, pupils identify how sounds are made and recognise that vibrations from sounds travel through a medium to the ear. Learning includes the anatomy of the ear and how whales communicate via Whale Song. The knowledge of sound acquired in this unit

recognise that vibrations from sounds travel through a medium to the ear find patterns between the pitch of a sound and features of the object that produced it find patterns between the volume of a sound and the strength of the vibrations that produced it recognise that sounds get fainter as the distance from the sound source increases.	will help pupils find patterns between the pitch of a sound and features of the object that produced it. It also helps pupils find patterns between the volume of a sound and the strength of the vibrations that produced it. Pupils will know that sounds get fainter as the distance from the sound source increases. **Begin with a re-visit of elements of Light from Year 3.** **<u>See Summer 1 INTENT document to support planning</u>**

Year 5	Focus of Study:
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils should be taught to: describe the changes as humans develop to old age.	**Context for study**: This unit is the seventh of eight science units where pupils study animals, including humans, as part of the discipline of **biology** - the study of living **organisms.** Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils can use classification keys and interpret food chains: identifying producers, predators and prey. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Previous learning includes the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the

	food groups and their role in human development. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. In this Year 5 unit, pupils learn about the changes a human goes through as they develop across their lifetime. Pupils describe the changes as humans mature to old age and draw a timeline to indicate stages in the growth and development. Pupils learn what older people need to stay healthy and the difficulties they may face, including memory loss and a weakened immune system, as a result of old age. Pupils learn how babies grow and develop, and about puberty. New learning includes the gestation period and life expectancy of different species of animals. This unit is the precursor to work in Year 6 as pupils learn about the circulatory system. **Begin with a re-visit of elements of Animals inc humans from Y4.** **<u>Knowledge Content:</u>** The study of animals, including **humans** regarding the changes a human goes through as they develop across their lifetime is part of the discipline of **biology** - the study of living **organisms.** Know that all humans grow and develop from the time they are born until old age- lifecycle of a human Know the terms **foetus**, **baby, infant/toddler, child, teenager/adolescent, young adult, adult and elderly/pensioner, death** and the periods with which they roughly refer. **Baby: 0 - 1 year** **Infant/Toddler: 1 - 3 years** **Child: 3 - 12 years** **Teenager/ adolescent: 12 - 18 years** **Adult: 18+ years** **Pensioner (old age): 65+ years** Know that **puberty** is when changes occur in the body during **adolescence**. It is the end of the development of the body. Know that an **embryo** develops into a **foetus** in the mother's **womb** and that over time the foetus develops typical human features including arms and legs. Know the development of a foetus

	Know that a midwives' role is to look after a pregnant woman and her baby throughout the pregnancy, during labour and birth and for up to 28 days after the baby has been born. Know some developmental milestones from birth Know that puberty is when a child's body begins to develop and change as they become an adult. Know examples of puberty changes in girls and boys Know that we must look after our mental health. A healthy mind is as important as a healthy body. We can look after our mental health by: -Eating well, drinking water, doing activities we enjoy, sleeping well, having good friends, working towards our goals, talking to people we trust about how we feel. We can help each other by: Talking, Listening, Telling <u>Gestation Periods</u> Know that nearly all mammals are **viviparous** - they give birth to live young rather than laying eggs. Know that the **gestation** is the development of an **embryo** up to the point of birth. Know that an embryo is an unborn animal at the very early stages of development. Know that the gestation period refers to the time an embryo spends in development in the womb. Know that an embryo develops into a **foetus** (in humans this is after 8 weeks) Know examples of gestation periods <u>Key Vocabulary</u>: **Adolescent, adult, asexual reproduction, sexual reproduction, fertilization, death, teenager, elderly, toddler, reproduction, foetus, growth, puberty, menstrual cycle, gestation.** **<u>WORKING SCIENTIFICALLY</u>** I can make predictions on gestation periods of animals. I can record data using a scatter graph. I can make careful observations as we grow older.

	I can record my learning using scientific diagrams and vocabulary. I can interpret my findings to help others. I can evaluate my learning **<u>Scientific Enquiry</u>** I can look for patterns in gestation periods. I can notice changes over time. I can use research and my own subject knowledge to order stages of human development. I can identify changes in the body. I can use research and subject knowledge to help others. I can use research and subject knowledge to help others.

Year 6	Focus of Study: Animals inc. humans
NC Objectives	**Key Explicit Knowledge and Vocabulary**
Pupils should be taught to: identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood recognise the impact of diet, exercise, drugs and	**Context for study**: This is the final unit of eight science units where pupils study animals, including humans, as part of the discipline of **biology** - the study of living **organisms.** Pupils have a secure knowledge of life cycles and what animals, including humans, need to survive. Pupils know that humans and some other animals have skeletons and muscles for support, protection and movement. Pupils know the functions of the basic parts of the digestive system and the functions of different types of teeth in humans. Previous learning includes the changes a human goes through as they develop across their lifetime. Pupils learned how babies grow and develop, and about puberty. Pupils know what older people need to stay healthy and the difficulties they may face as a result of old age. This Year 6 unit builds on pupils' knowledge of the importance of a healthy lifestyle, including a balanced diet and the effects of sugar, the different food groups and their role in human development. New learning includes recognising the impact of diet, exercise, drugs and lifestyle on the way their bodies function. In Year

lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans.	6, pupils identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Pupils also describe the ways in which nutrients and water are transported within animals, including humans. This is the precursor to work studied in KS3 when pupils continue to study the human body as part of the discipline of biology. **Begin with a re-visit of elements of Animals inc humans from Y5.** **<u>Knowledge Content:</u>** The study of animals, including **humans** regarding **the human circulatory system** is part of the discipline of **biology** - the study of living **organisms.** Know the **circulatory system** is the system that **circulates** blood through the body. Know that this consists of the **heart, blood vessels, blood, veins, arteries, capillaries, oxygen, lungs and ribcage.** Know the location of the lungs and heart Know that the heart is about the size of your fist and located in the front and middle of your chest, behind and slightly left of your breastbone. Know how to label the following diagram Know that the heart is a hollow muscular organ that pumps the blood through the circulatory system by regular **contractions.** There are four **chambers** with two **atria** and two **ventricles**. Know the following sequence that explains the function of the heart - 1. **Deoxygenated** blood flows into the heart from the body through the veins 2. This blood is pumped out to the lungs through the **pulmonary artery** 3. Blood is then **oxygenated** in the lungs 4. Blood returns to the heart through the **pulmonary vein** 5. The oxygenated blood is then pumped out of the heart through the **aorta** 6. The blood travels around the body delivering oxygen and nutrients to the organs. Know that **oxygenated** means 'to be enriched with oxygen' Know that **deoxygenated** means 'to be depleted of oxygen' Know that blood is red when **oxygenated** and deep purple or blue looking through skin when not.

	Diet, exercise, drugs and lifestyle Know that diet can impact on lifestyle as fatty rich foods can **clog** arteries and veins, preventing blood from delivering what is needed. Know that exercise can improve the health of a person by removing **fatty deposits** from the body. Know that some exercises are called **cardiovascular**, and are designed to improve the fitness of the overall circulatory system by **strengthening** the organs and **pulse rate**. Know the impact of having little exercise and poor diet will have, and know that taking certain drugs such as cocaine can cause permanent damage to the circulatory system (link to PSHE drugs curriculum) Know that we measure our heart rate through our pulse. We record this at beats per minute. Know that Santorio was an Italian physiologist, physician and professor who was the inventor of many medical devices. He invented the clinical thermometer and a pulse clock Key Vocabulary: **Heart, pulse, rate, pumps, blood, blood vessel, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.** **WORKING SCIENTIFICALLY** I can use scientific diagrams, models and labels to explain processes. I can take accurate measurements and record in a table. I can use labelled diagrams to support my explanation about the structure of blood. I can focus on scientific reasons for why things happen and use models to explain my thinking. I can plan my investigations and record my results. I can observe what happens when you smoke using a model. **Scientific Enquiry** I can identify and classify parts of the body and the heart.

	I can use research by Santorio to support my investigation. I can identify parts of blood and create a model to explain my thoughts. I can use research and scientific vocabulary to support my explanations. I can plan a comparative test. I can use research to support the presentation of my ideas.